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NURSE CALL SYSTEM

SPECIFICATION FOR NURSE CALL SYSTEM

1 PART 1 GENERAL

1.01 OVERVIEW

A. Provide a complete working Nurse Call System based upon the specification outlined here to include all necessary devices that provide the functions listed in this specification for *Wm. Jennings Bryan Dorn VA Medical Center*. This facility will be referenced as the OWNER in this specification.

B. If an operational function is specified that requires hardware or software to complete that specific function, then consider that software or hardware part of this specification. The cost of any omissions of software or hardware necessary to complete all operational functions outlined in this specification shall be borne by the contractor providing this system.

C. All Nurse Communications Network devices shall be UL-1069 listed. This includes routers, hubs, switches, and room control devices. The nurse call network shall be an FDA Registered Class II (or higher) medical device and the system's manufacturer shall be an FDA Registered Operator. Field wiring shall be CAT 5E or CAT 6 cable, control wiring for power distributions and very long runs, and utilize an optional fiber backbone (when distances exceed normal Ethernet limitations). All station equipment shall use plug on connectors and all switches, routers and controllers shall utilize standard RJ-45 modular connections. All remote devices utilizing standard structured cabling shall be capable of PoE (Power over Ethernet) or power supplied within the CAT 5E or CAT 6 cable jacket. Systems which require separate DC power to devices, remote power supplies, or heavy DC wiring to each individual room shall not be accepted. Wiring shall be capable of either being installed in conduit or cable trays, where shown on the plans. Nurse Communications cabling may be run along with other low voltage and data cables where permitted by code. Nurse Communications cabling to be separated out from any high voltage AC or DC wiring that exceeds 90 volts, or which violates any national or local electrical code.

D. The system must be UL 1069 listed as a Nurse Communications Network. Systems listed by other nationally recognized testing laboratory may not be accepted. The system shall be capable of interconnecting with the hospital's LAN (Local Area Network). This connection shall be minimal and utilize only one Ethernet 100 Mbps (or optionally 1 Gb) connection to accomplish all ADT, hospital information, reporting software and information exchange. The HL-7 standard shall be utilized for receipt of patient information from the ADT system.

E. The OWNER will provide one VPN connection. One VPN is for the servicing contractor to diagnose any maintenance issues and to maintain the system

offsite. Diagnostic software shall be web based and permit e-mail notification of high level alarms. All software applications shall be HIPAA and PIPEDA compliant and shall allow for patient name aliases and alternative display methods. Complex user names, expiring passwords, granular permission settings and role based security shall be standard. All databases shall be ODBC compliant, MS SQL 2008.

F. Overall Nurse Communications Network shall utilize VoIP communications between all major components: nurse consoles, staff terminals, telephones and controllers. Any nurse call console and staff terminal must be able to answer any patient call placed in the network. Systems not utilizing the VoIP standard will not be acceptable. The communication standard shall be SIP protocol when telephones are integrated. The OWNER will not be providing any analog ports to the nurse call network. As part of this contract, the OWNER will either supply or establish that there is a telephony call network which supports the SIP protocol within the OWNER'S facility. Systems requiring digital to analog converters will not be accepted.

G. The capability to assign patients to staff shall be via a networked software infrastructure on existing OWNER workstations. There are no known software limits to the number of users or units being assigned. It shall also be possible to have multiple users logging onto system via barcode or other standard human interface devices. Log on process identifies user and the current device used that day. Systems not utilizing bar code or HID sign on and/or only single PC assignment from nurses' station will not be accepted under this specification.

H. Ethernet ports will be provided by the OWNER for HL-7 integration to the entire network. Those nurse call systems requiring more than one interface to the live environment will not be acceptable. Additional servers will be provided by the OWNER on an as needed basis for those specific nurse call options that are selected. All servers will be installed in the facilities data center. All software must be capable of being diagnosed and supported by the distributor remotely.

I. The Network shall be expandable to any combination of over 15,000 bed, duty, or staff stations and 120,000 sub-stations connected as a contiguous interconnected system. Multiple buildings and intra-building connections may be linked together utilizing a fiber or an Ethernet connection. Audio communications between devices shall be digital and virtually non-blocking, so as to provide fast, instantaneous communications without queuing or delay.

J. The Network shall be capable of backward compatibility to prior generation of Nurse/Patient Communications system manufactured by same vendor via a network adapter module. This module will allow calls from the prior generation system to appear and go into audio communication from the common consoles, staff terminals, duty stations, zone lights and PC displays as well as allow patient to staff assignment via a common client application.

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1.02 SCOPE

A. *Wm. Jennings Bryan Dorn VA Medical Center* is furnishing and installing a new nurse call system with the design based on a Rauland-Borg Responder Nurse Call system to connect to existing nurse call system as directed by RSS. Nurse Call system and components to be furnished and installed by the local system vendor. All conduit, wire, back boxes, AC power and associated electrical work shall be furnished and installed by the Electrical Contractor. Nurse Call terminal cabinets are to be furnished by the nurse call system vendor and installed by the electrical contractor. Elevations of Nurse Call devices are to be determined by the Architect prior to installation. The Architect will provide a drawing of the typical nurse call device locations. Other vendors must be pre-qualified twenty (20) days prior to bid. Alternate manufacturer to furnish and install a complete, working nurse call system for owners review and shall remain the property of the owner. Pre-submission and pre-approval does not guarantee system acceptance. Removal of any existing nurse call devices are to be included in this project and be done by a local Certified Rauland Borg System integrator. If any other manufacturer is pre-approved they must include the cost from an authorized local Rauland distributor to perform all the work associated with the demolition of the existing Nurse call System. Contact Ronco Specialized Systems, Inc. (RSS) at 803-739-8959 for information and pricing required for demolition. The GSA contract number is GS-35F-0438L.

B. General Construction work associated with the nurse call system is not part of this scope of work. The electrical contractor, not the system supplier or product manufacturer, shall furnish and install all conduit, back boxes, raceways, modified device plates and critical power branch circuit wiring.

C. The owner will be responsible for providing all required servers and network equipment. The system supplier is not responsible for servers either virtual or otherwise.

D. All conduit shall be furnished and installed by the Electrical Contractor and the Nurse Call System supplier is not responsible for and conduit work.

1.03 QUALIFICATIONS

A. Authorized Distributor for product supplied. Authorized Distributor Letter from manufacturer required upon request of specifying authority. Proof of a local service center (with-in 20 miles of the facility) complete with certified technicians must be provided to the owner. Factory certifications for a minimum of 3 technicians that work at the local service center must be provided. No system will be approved without the certificates from the technicians. Local service center must provide 24/7 – 365 day service and have the ability to have a factory authorized technician on site (if required with-in 1 hour after the first service call is made.

1.04 REFERENCES

A. Underwriter's Laboratories UL-1069 current release

B. Canadian Standards Association

C. National Electrical Code

D. NFPA 70 and 99

E. U.S. Dept. of Labor / Occupational Safety and Health Administration

F. State Hospital Code / Joint Commission of Hospitals – Nurse Call Requirements

G. NEMA installation standards

H. European Union's *DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003*, commonly known as the RoHS Directive

1.05 SYSTEM DESCRIPTION

A. System hardware shall consist of a nurse call network comprised of VoIP nurse consoles, PC consoles (OWNER provided), nurse call network controllers, patient stations, power supplies, battery back-up, dome lights, entertainment cords, call cords, pull cord stations, emergency push button stations, wiring and other options such as bed side-rail interfaces, wireless bed interface, pocket page interfaces, computer interfaces, wireless/telephone network interfaces, VoIP staff terminals, RTLS (real time locating system) and network adapter module as shown on drawings. All necessary equipment required to meet the intent of these specifications, whether or not enumerated within these specifications, shall be supplied and installed to provide a complete and operating nurse/patient communications network.

B. System hardware and firmware shall be the product of a single, reputable manufacturer with a proven history of product reliability and sole control over all source code. Manufacturer shall provide, free of charge, product firmware/software upgrades for a period of one year from date of installation for any product feature enhancements. Manufacturer shall provide a 5 year warranty on all manufactured hardware. System configuration programming changes shall not require any exchange of parts and shall be capable of being executed remotely via a VPN connection. Any supplier whose equipment cannot support remote system configuration programming and diagnostics via VPN or requires the exchange of parts, chips for system configuration programming changes will not be acceptable.

C. All programming and firmware changes shall be accomplished on a working system without interruption to the normal operation of the system. Therefore, all system switches and controllers, which hold this firmware and system parameters must have DUAL storage. While updates are being made to one set of firmware, the system shall be working and fully functional on the original firmware (i.e. A and B memory blocks). It shall be possible to switch to the NEW system control software modules by a single system command. In the event of an error or failure in the update process, the system shall revert back to the previous firmware.

D. All communications shall be full duplex audio, not only on handsets, but all loud speaking devices, including patient, staff, duty, staff terminals, and pillow speakers. Systems that do not have full duplex audio or do not have separate microphone and speaker capability within the pillow speakers will not be accepted.

E. All wall mounted stations shall be flush mounted using snap tight cover plates. Sub plates shall be slotted and adjustable for trimming the mounting for "squaring" the vertical and horizontal fit. All screws shall be hidden.

F. All flush mount station buttons shall use a bio-seal cover to facilitate the use of disinfectant cleaners.

G. Entire Network shall be supervised, including all sub-stations. Reporting of station failure shall be to any designated console, PC, e-mail, or wireless device. Remote diagnostics shall be utilized to quickly locate the source of the problem.

H. Up to 99 different staff levels may be defined within the nurse call network to facilitate work flow within and outside of normal nurse call activity (i.e. environmental services, facilities, transportation, lab, pharmacy, etc.).

I. Nurse call network shall support a VLAN configuration to separate activity in the nurse call network from other hospital LAN traffic. Nurse call network can span multiple subnets on a hospital's LAN.

J. All specified equipment shall be manufactured using surface mount technology (SMT) and manufacturing testing shall utilize Hewlett Packard ATE (Automated Test Equipment) to assure the highest quality production. Specifying authority may request test procedures and/or results of tests on specific equipment being supplied. Manufacturer's testing procedures must be available upon request, including test equipments model number, serial numbers and date of last calibration.

K. The nurse call network shall support a GUI interface that sits on the hospital LAN. This interface consists of multiple modules such as staff assignment, PC call display, call detail recording, exception reporting, etc.

L. The nurse call network shall support at least 990 call processes to facilitate work flow and call escalations to various staff and or groups.

M. Nurse call network shall support any Real Time Locating System (RTLS) via an open architectural interface.

N. Nurse call network shall support any telephone or pager device via an open architectural interface.

O. Nurse call network shall support any ADT system via an open architectural interface.

P. Nurse call network shall support any staff assignment system via an open architectural interface.

Q. Nurse call network shall support any data backup system.

1.06 SUBMITTALS

A. Any supplying contractor proposing equipment which is not the base standard for this specification must provide full submittals at the time of bid. This option shall be exercised at the discretion of the OWNER/specifying authority.

B. Prior to submission of bid, the supplying contractor shall submit six (6) complete submittal sets. These sets are to be submitted in a three ring binder, a continuous spiral binder, or plastic binding that allows the booklet to lie flat while open. Each booklet shall consist of the following:

Page 1: Name of supplying contractor and project name.

Page 2: In the following order, a listing of: component quantities, equipment manufacturer, model number, and description of each component being supplied. If equipment being supplied is not the specified equipment manufacturer's model, alongside the submitted model number and description, list the specification paragraph that corresponds to the equivalent specified model. Failure to provide this information will result in the rejection of submittals.

Page 3: Recently dated (within one year from submittal date) support letter from manufacturer stating that the supplying contractor is an Authorized Distributor of the product being supplied.

Page 4: Statement that warranty hardware from manufacturer for 5 years or statement of vendor extending manufacturer's original warranty to 5 years.

Page 5: Copy of the installing technician(s) certificate of completion from the manufacturer's training school for the equipment being proposed.

Page 6: Statement by contractor of how and when they will complete In-Service Training, including the exact number of hours being provided per system, procedures they will follow, what training aids are provided (manuals, video tapes, etc.) and how contractor will conduct training.

Page 7: Statement from contractor of exactly how they will test installed equipment and wiring, including recommendations by manufacturer, prior to commissioning of system. . Owner to furnish AutoCAD floor plans prior to submittal preparation.

Page 8: Provide a list of recommended spare parts to maintain all systems specified after the warranty period. Also provide the purchase price and turn around cost associated with each item. List separately the cost of an annual maintenance contract. Show the hourly, purchased labor rates for both regular and emergency service. State any additional charges that may accompany labor charges such as travel charges.

Pages 9+: One catalog sheet per product of equipment listed on page 2; in the exact order as listed on page 2. Each catalog sheet shall describe mechanical, electrical and functional equipment specifications. The catalog sheet must also include a photograph of the product. Photocopy duplications of the manufacturer's original equipment catalog sheets will be allowed as long as they provide adequate clarity of both the printed word and graphics/pictures. Submittals that are not of adequate clarity or content may be rejected and re-submission may not be allowed.

Last Page(s) or Separate: Provide all inter-equipment wiring diagrams and drawings necessary to install the equipment being supplied. These drawings will show all wiring types by wire gauge, conductors and wire manufacturer. These drawings must be updated prior to completion of any work to reflect changes that may have been made during actual installation.

C. In the event the specifying authority decides to reject the submittals of a supplying contractor, the specifying authority may ask the contractor to re-submit if the discrepancies are minor. Otherwise rejection of submittals means the specified product must be supplied.

1.07 PROJECT SITE VISIT

It is the responsibility of all prospective contractors to make an adequate inspection of the project site. A mandatory site visit is scheduled for *date*. Any contractor not registered as having attended the mandatory site visit tour will be disqualified and any bid proposal will automatically be rejected.

1.08 DEMONSTRATIONS

A. It will be necessary to utilize demonstration equipment to test the functional operation of the contractor's submitted equipment. Contractor will be notified of any demonstration dates and times. If such demonstrations are utilized, it will be the sole judgment of the OWNER and specifying authority to decide whether a contractor/manufacturer meets or exceeds the specification.

B. All demonstrated equipment must be of a standard single manufacturer and meet the same required testing and conditions that are applicable to the manufactured equipment. Custom or modified equipment that is not of standard, current manufacture can not be demonstrated.

C. If integrations are specified as part of this project, then these integrations must be demonstrated. As an example, the integration to the selected wireless vendor must be fully functional, with voice capability and call display.

D. If necessary, OWNER and/or specifying authority may visit manufacturer's facility to view functioning equipment or demonstrations and witness equipment manufacturing techniques and/or testing procedures.

1.09 SAMPLES

The OWNER/specifying authority reserves the right to request one each, samples of terminal (station) equipment for the purpose of coordinating colors, aesthetics, trimplate sizing, etc. These samples would be supplied at no-cost to the OWNER.

1.10 SCHEDULING

It is the responsibility of the contractor to coordinate all work with the other trades for scheduling, rough-in, and finishing all work specified. The OWNER will not be liable for any additional costs due to missed dates or poor coordination of the supplying contractor with other trades.

1.11 WARRANTY

A. The supplying contractor shall provide a warranty on the system which shall include all necessary labor and equipment to maintain the system(s) in full operation for a period of one year from the date of acceptance.

B. Manufacturer shall provide, free of charge, product firmware/software upgrades throughout the 1 year warranty period for any product feature fixes.

C. In addition, the equipment (parts) warranty for all core system components including control / switching equipment, power supplies, patient stations, sub-stations, and nurse consoles shall extend to a total of at least five (5) years.

D. After the acceptance of the system(s) service shall be provided on the following basis:

Emergency Service - Provided **24 hours a day**. When a **total or catastrophic failure** of equipment is reported to contractor, within **2 hours of notification**, a service person will be on site. (An example of a catastrophic failure would be a hub failure or a nurse console failure.)

Routine Service - Provided **within 4 business hours** (9 a.m. to 5 p.m., Monday through Friday, excluding holidays) **of notification**. When a minor failure of equipment is reported to contractor, a service person will be on site within 24 hours of notification. (An example of a minor failure includes peripheral equipment such as control stations, entertainment speakers, corridor lights, pull-cord stations, etc. which normally affect only one patient or patient room.)

1.12 MAINTENANCE

A. Provide necessary spare parts, noted on Page 8 of submittal (see 1.05A), after commissioning of system(s) and prior to final payment.

B. Provide the cost of tuition for one person designated by the OWNER to attend a service school held by the equipment manufacturer. Transportation to this school will be borne by the OWNER. Lodging, breakfast and lunch to be borne by manufacturer or supplying contractor.

C. The OWNER may choose to have the supplying contractor maintain the system(s). The level of service provided during the maintenance contract period would be the same as the warranty period for routine and emergency service. All labor and equipment costs would be covered under this contract. Supplying contractor must state exact billing amounts, billing periods and all costs associated with this maintenance agreement and list any items that would not be covered under the service/maintenance agreement. Firmware/software upgrades would be available with a software maintenance agreement.

2 PART 2 PRODUCTS

2.01 MANUFACTURERS

The products specified shall be new and of the standard manufacture of a single reputable manufacturer. As a reference of standard and quality, functionality and operation, it is the request of the OWNER that bids be based on equipment manufactured by Rauland-Borg Corporation or an approved equal as this is an expansion of the existing Nurse Call system and the existing Nurse Call must be connected to the nurse call system being installed as part of this project. All connections to be done by Ronco Specialized Systems or approved equal and the cost for any required connections to the existing Rauland Nurse Call System shall be included in the cost of this project. Change orders will not be paid by the owner for any and all connections to existing nurse call system and are the

complete responsibility of the system supplier. Prior approval required as listed in other sections of the nurse call specification.

2.02 REMOVAL OF EXISTING PRODUCT

A. Remove all existing product and deliver to the OWNER, or at the direction of the OWNER, properly dispose of same.

B. Per National Electrical Code, remove all unused or "dark" wiring utilized by the removed nurse call system.

C. The OWNER will vacate one nursing unit at a time, making it available on a time table for the installation of the new equipment.

-OR-

D. The OWNER will continue to occupy the nursing units where equipment will be replaced. Supplying contractor will need to coordinate work with nursing administration for each nursing unit to obtain a group of four rooms per day for replacement of equipment. The existing nurse call equipment must be maintained and operational during this replacement period except for the four rooms being renovated.

2.03 NURSE CALL NETWORK WIRING

All Nurse Call Network wiring shall be only CAT 5E or CAT 6. Plenum wire shall be used in open areas and standard CAT 5E or CAT 6 within conduit. System shall be capable of injecting DC power into a CAT 5 or CAT 6 run, for additional rooms, or long runs, by running a separate DC cable pair to a remote location.

2.04 NURSE CALL CONTROLLER(S)

A. Furnish as needed in each nursing unit a nurse call network controller. Each controller shall provide the following:

1. Non-blocking, duplex communications between consoles and rooms, sub stations and duplex pillow speakers, within each 6 station loop. Provide four loops for a total of 12 dynamically allocated speech paths.
2. CAT 5E or CAT 6 wiring standard utilizing PoE (Power over Ethernet) between console and nurse call controllers and local wiring to power room station equipment and dome lights.
3. VoIP audio to Nurse Call Network, VoIP Nurse Console, VoIP staff terminal, wired or wireless phones via SIP protocol**.** VoIP digital audio stream out to rooms without IP overhead signaling.

4. Up to 96 corridor lights can be operated with a single controller**.**

B. Controller must be life safety grade meaning that it shall not require regular rebooting for continued basic functions of system and it shall be possible for controller to act as a stand alone controller should loss of network communication occur. Personal Computers may not be used for this purpose. PCs will only be allowed outside of the UL-listed nurse call network on the customer supported LAN.

C. Nurse call controller(s) are connected to the hospital's LAN via Ethernet switches. The nurse call servers also connected to the hospital's LAN are running specialized software for using hospital data resources and telephone communications resources.

2.05 VoIP NURSE CONSOLES

A. Furnish as shown on plans, a UL-1069 listed VoIP nurse console capable of the following functions:

1. Full duplex audio
2. Color display
3. 12 or 24 hours time display and synchronization to hospital standard network time from the nurse call gateway server including any daylight savings time changes supported by the network.
4. Display up to 3 incoming calls each with an individual elapsed timer which increments time since call was placed. Also provide the ability to scroll to see more incoming calls.
5. Power over Ethernet powered connection to UL-1069 listed Ethernet controller. No local power supplies required.
6. Choice of hands-free duplex communications through built in speaker and separate microphone or private handset conversation.
7. Ability to create up to 32 soft keys, user-configurable, with 4 buttons, 8 screens deep.
8. Console shall be interactive with an associated PC workstation (user provided) without the necessity of any interconnection to the PC. The work process relationship shall be software defined through the network connections.
9. Optional tone/mute of calls in progress.
10. Ability to block all nurse call loudspeaker paging to facilitate a low noise patient environment. Password protection can be enabled to only allow authorized access to audio paging.

11. Ability to swing an individual room or any group of rooms by touching one labeled touch point. Room(s) and consoles may be located anywhere within hospital nurse/patient communications network.
12. Console can be programmed to be the receiver of any call that is not answered by another console, or can be programmed to receive any call from a console that has failed or has been unplugged, or otherwise not receiving the call (call orphaning).
13. Ability to dial through built in key pad.
14. Self-contained unit which shall not occupy more than 88 square inches of desk space and is desk or wall-mountable.
15. Support manual Staff Follow functions. When Staff Follow is enabled, call-tones for a prescribed area will automatically be forwarded to the room station speaker where staff members are located. Staff location may be determined manually by entering the room number into the console or automatically using staff register stations or registration via RTLS. Pressing the call button on that station shall silence the tones. When a new call is placed, the tones shall automatically be restored.

2.06 PC CONSOLE DISPLAY

A. Provide a PC console display on any networked OWNER provided PC that meets the system manufacturer's minimum specifications, whether it utilizes touch screen or standard mouse control. Also, OWNER provided wall mounted PC displays shall have the global option provided in this software package of a touch screen keyboard. When a PC is "associated" with a VoIP console described previously, it shall have full interoperability to provide user with easy to follow on screen functions, such as display of call priority, room and patient information. Selecting a touch point or by mouse click shall provide an automated service reminder. While in audio contact with the patient, an enriched display shall show all user defined display information, such as caregiver assigned, and pertinent patient information.

B. The following additional functions shall be provided at each one of these users' screens:

1. Full display of all calls, including corridor light color sequence.
2. Complete electronically generated census of patients showing assigned caregiver, current patient needs as sent by service reminder process, time patient has been waiting for call answering, or need, list of caregivers on duty and staff location.
3. Ability to text message to any single individual, group of users, or all users, a text message to a pager or wireless phone display.

4. Ability to display calls in a centralized display format (i.e. Centralized Code Blue display).
5. Ability to display and route calls in a de-centralized workflow environment.
6. Ability to display all staff information, staff status, wireless extension and their location.

2.07 VoIP STAFF TERMINAL

A. Furnish as shown on plans, as part of the nurse call communications network, a UL 1069 listed VoIP Staff Terminal. This dynamic device shall serve as a patient or procedure room communications tool while providing staff with "soft" touch-points to initiate an instantaneous notification of an in room need. Additionally this terminal may be used as a functional nurse call console.

B. The following functions shall be provided:

1. Color touchscreen display.
2. Ability to create up to 60 soft keys, user-configurable, up to 8 screens per terminal.
    a. Sends specific need for that location. Examples: Emergency, Staff Assist, Cleaning Needed, Lifting Help, Transport, Order, Stat Order, Rounding, etc.
    b. Speed dial to any location
3. Power over Ethernet powered connection to UL-1069 listed Ethernet switch. Local power not required.
4. Full duplex audio
5. Hands-free duplex communications through built in speaker and separate microphone.
6. Display up to 3 incoming calls each with an individual elapsed timer which increments time since call was placed. Also provide the ability to scroll to see more incoming calls.
7. Ability to dial through touch key pad.
8. Ability to capture an individual nursing unit, selected units, or all units in hospital by touching single custom labeled touch point.

2.08 CAREGIVER ASSIGNMENTS AND SIGNING ON and OFF DUTY - Optional

A. Provide software to make caregiver to patient assignments from any OWNER provided PC workstation within the hospital by easy user sign on. Assignment

process shall be intuitive and indicate to that Supervisor making the assignment, each caregiver's patient load based on number of patients and patient difficulty. These assignments shall stay in queue until each individual signs on duty. The assignment is released when the caregiver goes off duty.

B. The following additional functions shall be provided:

1. Unlimited assignment of caregivers to patients, patients to caregivers.
2. Group assignments.
3. Assignments may be made up to 7 days in advance.
4. Easy display of prior day's assignment and easy click to accept if you want to keep assignment the same.
5. Display pertinent HL-7 fields for patient.
6. Allow for assigning advanced call escalation for un-answered calls.
7. Staff member shall have ability to use Bar Code for ID and wireless devices.
8. User's assignment can print out to a local printer.
9. User shall have the ability to go ON and OFF break forwarding their device to another caregiver and reflecting this activity in the reporting software.
10. Put staff on and off duty and assign a phone.
11. Conduct device based assignments as well as staff based assignments.

2.09 PATIENT STATIONS

A. Provide single patient or dual patient station as shown on plans.

B. Each patient station shall be capable of the following functions:

1. Separate speaker and microphone for full duplex audio. Entertainment audio to be muted when intercom in use.
2. One DIN pillow speaker receptacle per bed that shall have a tilt design, with automatic release of pillow speaker plug when pillow speaker cord is pulled at any angle.
3. Station shall support an optional module to feature bed side rail control on station to indicate the bed is disconnected. LED on station shall indicate that the bed is disconnected and that a bed out call is active.
4. Built in lighting control that interfaces directly to low voltage controllers**.**
5. One universal 1/4" jack for auxiliary alarm input/call cord per bed. Call priority of these receptacles shall be independent of any other button or receptacle**.**
6. No dummy plugs required**.**

7. Cancel button shall cancel any call on this station and any other station in room that is programmed for universal room cancel**.**
8. Continuous supervision.
9. Ability to service exchange station "hot" without removing system power or powering down the local controller.
10. Ability to program on a per patient station basis, each bed and entertainment/call cord receptacle to custom call priorities.
11. Supply where noted the Enhanced Single Patient Station that includes all the features above, and additionally, two programmable buttons: code blue and staff assist. Optionally these two buttons may be changed to any call process that is selected by OWNER by changing the buttons.
12. Supply where noted for the Enhanced Single Patient Station an optional Clear Button Cover to prevent accidental initiation of the additional programmable buttons. Cover is easy to install and has an easy to lift cover to access the buttons.
13. Unit shall mount in a standard 3-gang electrical box.

2.10 STAFF STATION

Provide as shown on plans a staff station. Unit shall provide two-way hands free duplex intercom to its assigned nurse console(s) by pushing a call in button. Station shall support an optional module to feature bed side rail control on station to indicate bed connection. LED on station shall indicate bed connection. Unit shall mount in a standard 3-gang electrical box.

2.11 DUTY STATION

Provide as shown on plans a duty station. Unit shall provide remote annunciation of assigned patient stations and sub-stations via 4 LED's and multiple call tones. Duty station faceplate LED's shall mimic corridor light activity for the assigned nursing area. Also provides two-way duplex intercom to the assigned nurse console(s) through separate speaker and microphone. Call tones generated at duty station must be identical and repeat in synch with tones produced at closest nurse console. It shall be possible to mute the call in tone, without cancelling call. The next call in, assigned to this duty station, will un-mute the station. Muting feature may be defeated in those jurisdictions that do not allow muting of duty station. The duty station shall be capable of being programmed for a specific time that a day/night mode takes place, allowing a volume change to the call-in tones. This feature is required to minimize noise for patients. Unit shall mount in a standard 3-gang electrical box.

2.12 SUB-STATIONS

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A. Provide as shown on plans, sub-stations which shall be flush mounted in a single gang box. All sub station cancel buttons will follow the cancel policy as defined in the system configuration. Typically canceling a high priority call can only be accomplished by the station initiating a call, while lower priority calls may be cancelled by any associated station in the room.

B. Individual sub-stations shall be:

1. Pull cord station shall be water resistant with a replaceable PVC pull-cord, and easily cleaned surface. The pull-cord shall have a large, easy to pull plastic “bell” attached. This station may only be cancelable with the room and not cancelable from the nurse console.
2. Pull cord station with Call button shall the same characteristics as above, with the addition of one extra pushbutton for call-in. This button shall be programmable separately from the pull-cord to indicate a different call process (i.e. call caregiver to return to bed) than the pull cord which may indicate an emergency situation. Although this station trims out to a double gang faceplate, the mounting is in a single gang box.
3. Pull cord station with Speaker shall have all the capabilities of the pull cord station with call button, and include a built in speaker and microphone for communications with the patient. Although this station trims out to a double gang faceplate, the mounting is in a single gang box.
4. Single call button station and Dual button stations shall be water resistant. The buttons shall be back lit and have the ability for a user defined customized call label corresponding to the 990 call priorities available within the system. An elapsed timer may be activated by any call button to start a count up timer on any clock that accepts remote activation.
5. Single and Dual call button station can have an optional Clear Cover to prevent accidental initiation of the call buttons. Clear Cover is easily lifted to access buttons and does not cover the Cancel button for easy cancelation of calls.
6. Remote Cancel Station shall have a large “Cancel” button and will follow the room cancel policy established by the system configuration.
7. Staff Registration station shall have four backlit buttons that allow by default three levels of staff and one Staff Assist Button. Any button can be configured as a staff registration or call button to provide maximum flexibility. Although this station trims out to a double gang faceplate, the mounting is in a single gang box.
8. Bed Status station shall have four backlight buttons: Transport, Cleaning Needed, Cleaning in Progress, Bed Ready. The buttons will indicate the room condition and alert transportation personnel to this room. When the Transport button is depressed, the transport person assigned to this area receives a wireless message to transport this patient, or alternately,

transportation dispatcher receives an on screen display. Environmental Services staff will receive a wireless message that this bed requires cleaning. Environmental Services and nursing supervisors are alerted to the bed's state. Alternately, customized descriptions can be assigned to this station for specific facility needs. Canceling an event maybe accomplished by pressing a button a second time, using the cancel button, or by pressing another button in the chain of events.

9. Supply where noted for the Staff Registration and Bed Status Stations an optional Clear Button Cover to prevent accidental initiation of the additional programmable buttons. Cover is easy to install and has an easy to lift cover to access the buttons.
10. A two jack auxiliary alarm station shall allow the connection of external patient monitoring devices via two (2) ¼ inch jacks. This allows individual annunciation of patient alarms to nurse call consoles and wireless devices. Each jack may be programmed for one of 990 call processes and may be configured for latching or non-latching. A call in timer may be set within system configuration to buffer a device that produces intermittent alarms.
11. Remote Tilt Release Pillow Speaker Station shall provide a remote connection for the standard 9 pin DIN connector associated with a patient station. This allows the remote installation of the patient station, while keeping the 9 pin receptacle close to the patient.
12. Provide where noted, a Remote Standard 8 pin DIN Pillow Speaker Station. This station shall function with legacy 8 pin DIN pillow speakers.
13. Provide where noted a Logical Input Station which allows any dry contact closure from an external device to activate a call into the nurse communications network.
14. Provide where noted a Logical Output Station that allows external devices to be controlled from the nurse call network. Either dry contacts or a driver voltage output shall be available.

2.13 CORRIDOR LIGHTS AND DOMELESS CONTROLLERS

A. Provide as shown on plans, the proper type of corridor light or domeless controller. Corridor lights shall contain four sections, each lighted by a long life, RGB LED capable of producing 7 colors. Each section shall have a diffusion lens which allows for 180 degree horizontal visibility of call lights. The corridor lights shall be capable of the following:

1. All segments of corridor light can indicate a call in any of the following 7 colors: Blue, Red, White, Green, Orange, Yellow, or Pink**.**
2. Custom call patterns (any combination of light segments, such as all segments blue for code blue).
3. Flash any single color or strobe the sections of the light in any color pattern.

B. Intelligence in the corridor light and domeless controller shall support up to 16 room devices and allow for the ability of any room station to be associated with any other room in the system. This allows special functions where needed, such as associated call stations and cancelling options, (i.e. door monitoring).

C. Staff registration shall be indicated by a custom color associated with that staff level (i.e. Green = Nurse, Orange = LPN, Yellow = Aide).

D. Domeless controllers shall have all the function of the corridor light, less LED's.

E. In the unexpected event of communications loss with the nurse call controller, corridor lights and domeless controllers shall enter a local room failsafe mode showing all calls in the hallway via the LED indicators.

F. Corridor lights and domeless controllers may be hot-swapped on the room-to-room communication line without the loss of communications to other devices on the local network.

G. Supply where noted a Mini Corridor Light that contains 2 sections for use in ward rooms or above bathroom doors. The top section is a White long life LED and the bottom section is a long life RGB LED capable of producing 7 colors. Each section shall have a diffusion lens which allows for 180 degree horizontal visibility of call lights.

2.14 PATIENT ENTERTAINMENT SPEAKER/CALL CORDS

A. Provide one (1) pillow speaker per bed station and 5% spares. The pillow speaker shall have a mating 9 pin din plug and nurse call button. TV control shall be programmed as a system function to allow pillow speakers to work with any standard hospital grade TV. Lighting control is optional to control up to two lights. All pillow speakers to have call assurance and monitor LED's. There shall be three different pillow speaker models (*specification writer choose one model):*

1. Standard Model: Digital TV control with Full duplex communications via built in microphone and separate speaker. There shall be three additional buttons for the use by the patient for special needs, such as "pain", "water", and "toilet". The system shall have the ability to discern the difference between these calls and send it to the appropriate care level. Controls for up/down volume, up/down channel. TV mute, closed caption and TV on/off shall be standard.

2. Enhanced Model: Digital TV control with full duplex communications via built in microphone and separate speaker. There shall be three additional buttons for the use by the patient for special needs, such as "pain", "water", and "toilet". The system shall have the ability to discern the

difference between these calls and send it to the appropriate care level. Controls for up/down volume, up/down channel. TV mute, closed caption and TV on/off shall be standard. A direct entry key pad gives patient ability to enter channel number.

3. Basic Model: Analog TV control with pillow speaker audio for communications and TV audio. Provide buttons for TV channel change/ON-OFF and volume control potentiometer**.**

B. **WIRELESS DEVICE INTERFACES – Optional-not part of this project** The Pocket Page Interface shall receive Ethernet messages from the nurse call network. Industry standard TAP protocol is sent to the hospitals pocket page transmitter.

C. The Telephone Interface shall receive, via an Ethernet connection, VoIP connectivity using the standard SIP protocol. This module shall support at least 60 simultaneous voice connections between wired/wireless phones and the nurse call network. *There shall be four different possibilities* (*specification writer choose one method):*

1. The facility will utilize a VoIP/SIP wireless phone system and an IP/SIP PBX. The software module shall directly support an interface through the OWNER provided Telephony/SIP Call server that communicates to the nurse call network gateway server. Any nurse call system that only utilizes analog station/trunk ports to communicate with SIP wireless phones will not be acceptable.

2. The facility will utilize a VoIP/SIP wireless phone system with a non-SIP PBX. The software module shall directly support an interface through the OWNER provided Telephony/SIP Call Server that communicates to the nurse call network gateway server. OWNER will also provide a Telephony/SIP Gateway. Any nurse call system that only utilizes analog station/trunk ports to communicate with SIP wireless phones will not be acceptable.

3. The facility will utilize a wireless phone system which is not SIP compatible and a VoIP/SIP PBX. The software module shall directly support an interface through the OWNER provided Telephony/SIP Call Server that communicates to the nurse call network gateway server. The supplying contractor is to provide middleware which interfaces the non SIP wireless phone system display to the nurse call system software module. OWNER provides wireless phone system OAI. OWNER will also provide a Telephony/SIP Gateway.

4. The facility will utilize a wireless phone system which is not SIP compatible and a non SIP PBX. The software module shall directly support an interface through the OWNER provided Telephony/SIP Call Server that communicates to the nurse call network gateway server. The supplying contractor is to provide middleware which interfaces the non

SIP wireless phone system display to the nurse call system software module. OWNER provides wireless phone system OAI. OWNER will also provide a Telephony/SIP Gateway.

2.15 ADT INTERFACE – Optional-not part of this project

A. Provide a HL-7 compliant interface (V2.2 – 2.5) for the purpose of receiving relevant patient information.

B. This interface shall be capable of the following:

1. Mapping of standard ADT segment field components and subcomponents to nurse call fields.

2. All updates shall be real time, but software shall buffer data for any interruption of service

2.16 LOCATION INTERFACE (RTLS -Real Time Locating System) – Optional-not part of this project

A. Provide an interface (OAI) to integrate with the facilities Real Time Locating System (specified or provided elsewhere) and the nurse call network. Nurse call features and location of staff shall communicate per standard API published by manufacturer of nurse call.

B. The full integration shall include, but not be limited to the following:

1. Staff location.

2. Ability to choose specific calls to be canceled as a staff member walks into room.

3. Optionally lights corridor light to show staff in room with specific staff color.

4. Ability to locate staff throughout the facility on networked PC.

5. Reporting on said functionality

C. **STAFF ASSIGNMENT INTERFACE – Optional-not part of this project** Provide an interface (OAI) to integrate with other systems within the hospital that also has a staff assignment component and the nurse call network. Nurse call features and patient assignments shall communicate per standard API published by manufacturer of nurse call.

D. The full integration shall include, but not be limited to the following:

1. Staff status

2. Staff device

3. Staff assignment(s)

4. Staff break

2.17 DATABASE MANAGEMENT

Provide standard ODBC (MS SQL 2008) compliant databases. Databases shall be able to be backed up using facilities standard backup processes and disaster recovery methods. Data stoage equipment is not part of this project.

2.18 REPORTING SOFTWARE Optional-not part of this project

A. Provide software that may be accessed by any networked PC work station that gives management patient call details in clear readable format. HL-7 integration shall make all pertinent patient details available, including the ability to search by patient name and/or patient ID number for those nurse call records associated for that patient during their stay, regardless of room/bed occupied. All reports shall be fully historical.

B. In addition, the reporting software shall provide the following functions:

1. Standard, global reports
2. Summary reports
3. Detailed reports
4. Graphic reports
5. Productivity reports
6. Staff coverage reports
7. Reports shall be viewed in Adobe Acrobat Reader
8. Any trained individual may utilize standard ODBC compliant reporting software to generate more enhanced reporting.
9. Does not require additional off-the-shelf software for the generation of reports.
10. Uses SQL Reporting Services for report generation.

2.19 WIRELESS BED INTERFACE- Optional-not part of this project

A. Provide, one per bed a Wireless Wall Unit that includes the following functions:

1. A wireless (RF) link between the Nurse Call system and a Feature Bed. This unit will receive any patient call or bed exit call from the associated bed.
2. Plugs into a standard 37-pin wall receptacle**.**
3. The Wall unit must provide a LINK LED and audible tone confirmation when linked successfully to the Bed Unit.
4. If a bed is moved out of range, a “bed out” call is placed in the system.
5. A Cancel button must be provided to silence tone notifications such as “Bed Out” or “Low Battery”.

6. Power is provided by Nurse Call system or via an A/C adapter.

B. Provide, one per bed, a Wireless Bed Unit for use with the above Wireless Wall Unit, that includes the following functions:

1. A wireless (RF) link between the Nurse Call system and a Feature Bed when used in conjunction with the Wireless Wall Unit.
2. Plugs into a 37-pin socket receptacle on a Feature Bed such as the Hill-Rom or Stryker Feature Beds with side rails.
3. The Bed Unit must have a Low Battery LED Indicator and tone. Bed Unit uses 3 AA batteries.

C. By pressing a LINK Button on each unit the Wall unit provides a LINK LED and audible tone confirmation when linked successfully to the Bed Unit. An Unlink button allows de-association of the Wall and Bed unit for removal of the bed from the room which also places a "Bed Out" call on the Nurse Call system. There must also be a LINK Reminder tone if an unlinked Bed Unit senses an unlinked Wall Unit after 2 minutes.

2.20 NETWORK ADAPTER MODULE - Optional-not part of this project

A. Provide a module that shall be capable of backward compatibility to prior generation of Nurse/Patient Communications system manufactured by same vendor.

B. Calls from prior generation system will have the following functionality with the network:

1. Calls will appear on the common consoles, staff terminals, duty stations, zone lights and PC displays.
2. Calls may be answered at consoles and staff terminals and establish audio, allow the setting of services and review of staff registration.
3. Calls may be displayed at PC displays, in list and census view, to allow setting of services and collaboration with the common display application.
4. Upgrading of calls to a higher level.
5. Changing the bed priority from "Patient" to "Special"
6. Ability to put a room in Privacy mode.

C. Use of common staff assignment client application to allow patient to staff assignments.

D. Use of common staff sign on/sign off client.

E. Staff member shall have ability to use Bar Code for ID and wireless devices.

F. Use of common reporting software.

G. Use of common wireless device interfaces.

H. Use of common ADT interface.

2.21 RESPONDER NETWORK CONCENTRATOR - Optional-not part of this project

A. Provide a module that shall be capable of allowing the nurse call network to span multiple VLANs/subnets on a hospital's LAN.

B. This module shall be capable of allowing nurse call network controllers to be on different VLANs/subnets and still communicate to each other across the hospital's LAN.

C. Nurse call network shall support VLANs to separate activity in the nurse call network from other hospital LAN traffic.

3 PART 3 EXECUTION

3.01 SUPERVISION

A. Only factory certified installers shall install, service and maintain the specified network system.

B. Manufacturer shall have the equipment manufacturer's engineer or their designated agent inspects the installation and operation of this network to determine that the network complies with all standards listed in Part 1.03.

3.02 TRAINING

Contractor shall provide thorough training of all nursing staff assigned to those nursing units receiving new networked nurse/patient communications equipment. This training shall be developed and implemented to address two different types of staff. Floor nurses/staff shall receive training from their perspective, and likewise, unit secretaries (or any person whose specific responsibilities include answering patient calls and dispatching staff) shall receive operational training from their perspective. A separate training room will be set up that allows this type of individualized training utilizing in-service training unit, prior to cut over of the new system.

3.03 NEEDS ASSESSMENT

Manufacturer shall provide a one-on-one meeting with the particular nursing manager of each unit affected by the installation of the new networked nurse/patient communications equipment. This meeting shall include reviewing the floor plan drawing, educating the nursing manager with the functions of the equipment that is being provided and gathering details specific to the individual units; coverage and priorities of calls; staffing patterns; and other pertinent details that will affect the training. In-service Scheduling materials and sample of training materials will be provided. A staff member

list and Pocket Page Tag Message list, if needed, be filled out for inclusion in the software. Information gathered will be provided to Contractor to program the network software.

3.04 IN-SERVICE TRAINING

Manufacturer shall provide thorough training of all nursing staff assigned to those nursing units receiving needs assessment of new networked nurse/patient communications equipment. This training shall be developed and implemented to address all types of staff determined at the needs assessment. Floor nurses/staff shall receive training appropriate to their needs, and likewise, unit secretaries (or any person whose specific responsibilities include answering patient calls and dispatching staff) shall receive operational training appropriate to their needs and charge nurses (or any person whose specific responsibilities include scheduling staff to patient assignments) shall receive operational training appropriate to their needs. A separate training room will be set up that allows this type of individualized training utilizing in-service training unit.

3.05 WIRING

A. Contractor shall terminate all wiring with manufacturer approved connectors. The use of wire nuts is prohibited.

B. All wiring shall be free from shorts and faults. Wiring shall be UL listed, NEC and NFPA 70, Article 25 approved.

C. Nurse patient communications network wiring shall not be run in the same conduit with other systems (i.e. Class 1 AC power distribution, fire alarm, entertainment systems, lighting controls, etc.).

3.06 ELECTRICAL POWER CONNECTIONS

A. It shall be the responsibility of the hospital to provide a minimum of two dedicated critical power branch circuits, 120 VAC, 60 HZ and the required conduit into the equipment cabinet. This power feed shall not have any other devices connected directly to it. Circuit breakers shall be 20 AMPS and shall be located in the critical power electrical sub-panel labeled “nurse call” will control this circuit. This electrical circuit will be connected to the hospital’s emergency critical power system for automatic power switch over during loss of utility power.

   1. Large hospital systems may require multiple equipment cabinets that are separated between floors and buildings.

   2. Care should be taken to connect power supply common mode lines when DC current can flow.

3. Large separation between controllers and power supplies should be connected by fiber optic cable to reduce common mode power supply issues.

B. Connect all network system power supplies and equipment cabinets to a common earth ground utilizing a 14 AWG, or larger, solid conductor which is at minimum the same conductor size as the AC feed wires.
C. Electrical Contractor is responsible for doing all work in accordance with required codes. This is not the responsibility of the system supplier.

3.07 ENVIRONMENTAL PROTECTION

Make certain that all network control equipment is accessible for service. Contractor shall notify specifying authority if designated equipment closet does not meet manufacturer's requirements for heat, radiation or static electricity.

3.08 PROTECTION OF NETWORK DEVICES

Contractor shall protect network devices during unpacking and installation by wearing manufacturer approved ESD wrist straps tied to chassis ground. The wrist strap shall meet OSHA requirements for prevention of electrical shock, should technician come in contact with high voltage.

3.09 CLEANING AND PATCHING

A. It shall be the responsibility of the contractor to keep their work area clear of debris and clean area daily at completion of work.
B. It shall be the responsibility of the general contractor not the nurse call system supplier contractor to patch and paint any wall or surface that has been disturbed by the execution of this work.

3.10 DRAWINGS

The Electrical Contractor, not the system supplier, shall provide as built drawings of all installed network components and associated wiring on building plans. Final payment will be made by the owner prior to the submission of the as-built drawings and Owners and Maintenance manuals.

END OF SECTION